

**What is claimed is:-**

1. A mobile station for a communications network in which data is transmitted in bursts including training sequences, the station comprising:  
5 an rf front end including a mixer;  
a frequency synthesizer for generating for generating a local oscillator signal for said mixer, the frequency synthesizer including an electronically tunable reference oscillator;  
a burst training sequence identifying means for generating a training  
10 sequence identifying signal; and  
frequency correction signal generating means for generating a control signal for tuning said reference oscillator in dependence on said training sequence identifying signal so as to correct an error in the frequency of said reference oscillator.  
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2. A mobile station according to claim 1, wherein the burst training sequence identifying means comprises correlator means for determining a correlation value for part of a burst and each of a plurality of training sequences and identifying the burst training sequence according to the largest correlation  
20 value.
3. A mobile station according to claim 2, wherein the correlator means is configured, for each of said training sequences, to repeatedly cross-correlate a part of the training sequence part of a burst with a training sequence, moving  
25 said part of the training sequence part of a burst relative to said train sequence between cross-correlations.
4. A mobile station according to claim 2, wherein the correlator means is configured, for each of said training sequences, to repeatedly cross-correlate a  
30 part of a burst, greater than the training sequence part of the burst, with a training sequence, moving training sequences relative to said part of a burst between cross-correlations.

5. A mobile station according to claim 1, including control means for tuning the mobile station to a control channel frequency to receive control channel bursts and the burst training sequence identifying means is configured to identify the training sequences of the bursts of said control channel.

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6. A mobile station according to claim 1, wherein the burst training sequence identifying means is configured to identify the training sequences of the bursts in a plurality of slots of a TDMA frame.

10 7. A mobile station according to claim 6, wherein said slots are contiguous.

8. A mobile station according to claim 7, wherein said slots are all of the slots of a frame.

15 9. A mobile station for a communications network in which data is transmitted in bursts including training sequences, the station comprising:  
an rf front end including a mixer;

a frequency synthesizer for generating for generating a local oscillator signal for said mixer, the frequency synthesizer including an electronically  
20 tunable reference oscillator;

a burst training sequence identifying means for generating a training sequence identifying signal; and

frequency correction signal generating means for generating a control signal for tuning said reference oscillator in dependence on said training  
25 sequence identifying signal so as to correct an error in the frequency of said reference oscillator,

wherein the burst training sequence identifying means comprises correlator means for determining a correlation value for part of a burst and each of a plurality of training sequences and identifying the burst training sequence  
30 according to the largest correlation value.

10. A mobile station according to claim 9, wherein the correlator means is configured, for each of said training sequences, to repeatedly cross-correlate a

part of the training sequence part of a burst with a training sequence, moving said part of the training sequence part of a burst relative to said train sequence between cross-correlations.

- 5 11. A mobile station according to claim 9, wherein the correlator means is configured, for each of said training sequences, to repeatedly cross-correlate a part of a burst, greater than the training sequence part of the burst, with a training sequence, moving training sequences relative to said part of a burst between cross-correlations.

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12. A mobile station for a communications network in which data is transmitted in bursts including training sequences, the station comprising:
- an rf front end including a mixer;
  - a frequency synthesizer for generating for generating a local oscillator
  - 15 signal for said mixer, the frequency synthesizer including an electronically tunable reference oscillator;
  - control means for tuning the mobile station to a control channel frequency to receive control channel bursts;
  - a burst training sequence identifying means for generating a training
  - 20 sequence identifying signal; and
  - frequency correction signal generating means for generating a control signal for tuning said reference oscillator in dependence on said training sequence identifying signal so as to correct an error in the frequency of said reference oscillator,
  - 25 wherein the burst training sequence identifying means is configured to identify the training sequences of the bursts of said control channel.

13. A mobile station for a communications network in which data is transmitted in bursts including training sequences, the station comprising:
- 30 an rf front end including a mixer;
- a frequency synthesizer for generating for generating a local oscillator signal for said mixer, the frequency synthesizer including an electronically tunable reference oscillator;

a burst training sequence identifying means for generating a training sequence identifying signal; and

frequency correction signal generating means for generating a control signal for tuning said reference oscillator in dependence on said training  
5 sequence identifying signal so as to correct an error in the frequency of said reference oscillator,

wherein the burst training sequence identifying means is configured to identify the training sequences of the bursts in a plurality of slots of a TDMA frame.

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14. A mobile station according to claim 13, wherein said slots are contiguous.

15. A mobile station according to claim 14, wherein said slots are all of the slots of a frame.

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16. A method of performing frequency correction in a mobile station for a communications network in which data is transmitted in bursts including training sequences, the method comprising:

receiving a burst;

20 identifying the training sequence in the burst;

generating a tuning control signal in dependence on said training sequence identifying signal; and

applying the tuning control signal to a tunable reference oscillator in a frequency synthesizer that provides a local oscillator signal to a front end mixer.

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17. A method according to claim 16, wherein identifying the burst training sequence comprises cross-correlating a part of a burst and a plurality of training sequences.

30 18. A method according to claim 17, wherein the cross-correlating comprises, for each of said training sequences, repeatedly cross-correlating a part of the training sequence part of a burst with a training sequence, moving said part of

the training sequence part of a burst relative to said train sequence between cross-correlations.

19. A method according to claim 17, wherein the cross-correlating comprises,  
5 for each of said training sequences, repeatedly cross-correlating a part of a burst, greater than the training sequence part of the burst, with a training sequence, moving training sequences relative to said part of a burst between cross-correlations.

10 20. A method according to claim 16, including tuning the mobile station to a control channel frequency, wherein the received burst is a control channel burst.

21. A method according to claim 17, wherein the training sequences used in said cross-correlating are the training sequences of the bursts in a plurality of  
15 slots of a TDMA frame.

22. A method according to claim 21, wherein said slots are contiguous.

23. A method according to claim 22, wherein said slots are all of the slots of  
20 a frame.

24. A method of performing frequency correction in a mobile station for a communications network in which data is transmitted in bursts including training sequences, the method comprising:  
25 receiving a burst;  
identifying the training sequence in the burst;  
generating a tuning control signal in dependence on said training sequence identifying signal; and  
applying the tuning control signal to a tunable reference oscillator in a  
30 frequency synthesizer that provides a local oscillator signal to a front end mixer,  
wherein identifying the burst training sequence comprises cross-correlating a part of a burst and a plurality of training sequences.

25. A method according to claim 24, wherein the cross-correlating comprises, for each of said training sequences, repeatedly cross-correlating a part of the training sequence part of a burst with a training sequence, moving said part of the training sequence part of a burst relative to said train sequence between cross-correlations.
26. A method according to claim 24, wherein the cross-correlating comprises, for each of said training sequences, repeatedly cross-correlating a part of a burst, greater than the training sequence part of the burst, with a training sequence, moving training sequences relative to said part of a burst between cross-correlations.
27. A method according to claim 24, including tuning the mobile station to a control channel frequency, wherein the received burst is a control channel burst.
28. A method according to claim 24, wherein the training sequences used in said cross-correlating are the training sequences of the bursts in a plurality of slots of a TDMA frame.
29. A method according to claim 28, wherein said slots are contiguous.
30. A method according to claim 29, wherein said slots are all of the slots of a frame.
31. A method of performing frequency correction in a mobile station for a communications network in which data is transmitted in bursts including training sequences, the method comprising:
- receiving a burst;
  - identifying the training sequence in the burst;
  - generating a tuning control signal in dependence on said training sequence identifying signal; and
  - applying the tuning control signal to a tunable reference oscillator in a frequency synthesizer that provides a local oscillator signal to a front end mixer.

32. A method according to claim 31, including tuning the mobile station to a control channel frequency, wherein the received burst is a control channel burst.